Onsite Estimating Sheet

0 1		400	_	- 1							
								Applicati	ons		
								The QT Serie	es does not meet the necessary		
									for the following applications: Fire Pumps		
Date		_ Location						NEC 700	Emergency Systems		
VOLTAGE TYPE	☐ 120/240 1Ø☐ Natural Gas				20/240 3	ߨ □ 277/4	180 3Ø	NFPA 20 Fire Pumps NFPA 99 Healthcare NFPA 110 Emergency Systems			
ELEC. SERVICE	□ 100 Amp □	200 Amp	400) Amp	□ 600 A	Amp 🗌 Oth	er	Referenc			
recommend: LOADS: Look for heav	intact local jurisdiction s contacting local auth y building loads such as o or sizing and determ	orities prior refrigeration,	to installat air condition	ion. ning, pump:				NEC 225 NEC 240 NEC 250 NEC 445 NEC 700	Overcurrent Protection Grounding Generators Emergency Systems		
	Motor Loa	nd Table	(refer to	Table 1)			NEC 701 NEC 702	Optional Standby		
Device		HP		RA LRA		unning (= HP)	Starting kW ¹	NFPA 37	Stationary Engines		
								NFPA 54 NFPA 58			
					-						
				-	-						
8								To Calculate	KW		
								120 V 1ø	Amps x 120/1000 = kW		
								240 V 1ø	Amps x 240/1000 = kW		
					-			208 V 3o	(Amps x 208 x 1.732 x PF) /1000 = kW		
								240 V 3ø	(Amps x 240 x 1.732 x PF) /1000 = kW		
									Amps x 480 x 1.732 x PF) /1000 = kW		
Starting kW for F	HP < 7.5 starting kW = HP > 7.5 starting kW = pading with no listed H	HP x 2	HP based	l on runnir	ng amps ir	n the chart on th	e right	PF is application Typical applicati	power factor (worst case 1.0) on power factor is 0.95.		
	Non-Motor	· Load Ta	able (re	fer to Ta	ble 2)	UPS Info					
					rating for a fil A rating for ar		ustem.				
	ey Colores CO.A. Est Colores (Colores El Colores Colores Accessor) (Colores Accessor) (Co	Ti Cina Charl Annahada a the da annahan				JO OXK	Training for an	Tarintorou 5			
			-	-		Transfer	Switch Availa	ability			
						SE-RTS			np service entrance rated		
						RTS		0, 400 Amp			
						RTSS200	A3 - Service	entrance rate	ed load shed switch		
						10 0	000 4		I		

Device	Amps	KW

GenReady – 200 Amp service panel

RTS and GenReady switches only work with the R-controller.

HTS

- 100, 150, 200, 300, 400, 600, 800 Amp

HTS switch only works with H100 controller. Avail, in NEMA 1, NEMA 3R and NEMA 12.

Recommended Generator Size _____ Refer to Generator Sizing Instructions on other side of this sheet.

INSTALL NOTES:

- 1. Suggested concrete pad minimum thickness of 4" with 6" overhang on all sides. Composite pad included with air-cooled products.
- 2. Consult manual for installation recommendations
- 3. Consult local authority having jurisdiction for local requirements.

Unsite Estimating Sneet

Generator Sizing Instructions:

There is not a single correct sizing solution. Following are several methods that, when mixed with good judgement, should result in an appropriately sized generator. Remember to consider load growth, seasonality, and effects of starting motors.

As municipalities and states adopt the new 2008 NEC Electrical Code, there may be new sizing requirements, spelled out in the code book, which the installation technician must follow. Always check with the local inspection department to confirm which code cycle will affect your install.

Never add Amps when sizing a generator. Convert Amps to kW and add kW to determine the required generator size. Power factors for various motor loads vary widely. Adding Amps without properly accounting for the power factor and/or mixing voltages will result in improperly sizing the generator.

When motors start, they create a current surge that step loads the generator and creates a voltage dip. After selecting a generator, reference the generator's surge capability using table 3. Verify that voltage dip is adequate for the application. Most commercial applications should be limited to about 15% voltage dip and residential applications should be limited to a 30% voltage dip.

Some applications utilize an uninterruptible power supply (UPS) to back up critical loads. Please read sizing guide for this load type.

Measurement Method

Use a clamp-on Amp meter or power analyzer to measure facility load levels. Clamp each leg separately and take the measurement during peak usage levels.

240V 1ø Applications: To determine peak usage in kW, add the highest Amp readings from the two legs, multiply by 120 and divide by 1,000.

(L1 + L2)120 / 1000

Size the generator 10 to 20% larger than the peak measured load.

3ø Applications: Add the peak Amp readings from all three legs and divide by 3 to determine peak Amps. Multiply peak Amps by volts, multiply the result by 1.732 (square root of 3), then divide by 1000 to convert Amps to kW.

Peak Amps = (L1 + L2 + L3)/3

[(Peak Amps x Volts) x 1.732] / 1000*

*Assumes power factor of 1.0

Size the generator 20 to 25% larger than the peak measured load.

Peak Amps = Peak kW=____

Billing History Method Commercial

Many commercial customers have a utility rate structure that has a peak demand charge. Using a year's worth of electric bills, size the generator 25% larger than the largest peak demand.

Verify motor and UPS load compatibility. Peak Demand = ____

Load Summation Method

- 1) Enter running kW for all motor loads (except the largest) expected to run during peak load levels into table 6. Refer to table 1 for typical motor load sizes and electrical requirements.
- 2) Enter kiV for all non-motor loads expected to run during peak load levels into table 7. Refer to table 2 for typical residential loads and rules of thumb.
- 3) Add the running motor load kW, non-motor load kW, and the starting kW of the largest motor load.

Motor load running total (minus largest motor):		kW (ref. table 6)
Non-motor load total:		kW (ref. table 7)
Starting load from largest cycling motor.		kW (ref. table 6)
Total electrical loads:	=	ΚW

Select generator.

Commercial (add 20 to 25% to total kW) Residential (add 10 to 20% to total kW)

- 4) Confirm that voltage dip is within acceptable limits by comparing motor LRA to generator surge capability (see table #3).
- 5) Confirm UPS compatibility (see page 6).

System Capacity - Load Calculation

If the local municipality or state you are in has adopted the 2008 NEC Code, you may be required to use this step. Article 702 of the 2008 NEC includes a new requirement for sizing (702.5B). If no other method for sizing is acceptable, sizing of the generator shall be made in accordance with Article 220 of the NEC. The system capacity estimating sheet will guide you through this process.

Project Layout

			A SECULATION OF THE SECULATION
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Ball Park Estimates (Do not use for final sizing)

Estimate based on 60% service size: (commercial) 240 Volts, 1 Ø: _____ Amps x .15 = __

208 Volts, 3 Ø: _____ Amps x .22 = _____ 240 Volts, 3 Ø: _____ Amps x .25 = ____ 480 Volts, 3 Ø: _____ Amps x .50 = ___

Estimate based on 40% service size: (residential)

240 Volts, 1 Ø: _____ Amps x .10 = ____ 208 Volts, 3 Ø: _____ Amps x .15 = _____ kW 240 Volts, 3 Ø: _____ Amps x .17 = _____kW 480 Volts, 3 Ø: _____ Amps x .34 = ___

Estimate based on square footage

Fast food, convenience stores,

kW = 50 kW + 10 watts/sq. ft.

restaurants, grecery stores

 $kW = 30 \, kW + 5 \, \text{watts/sq. ft.}$

Other commercial applications

Square footage = _____ Estimated kW = ___

Amps to kW Rule of Thumb (assumes .8 of)

For 480 volt systems

Amps = $kW \times 1.5$

For 208 volt systems

Amps = $kW \times 3.5$

For 240 volt 3 Ø systems

Amps = $kW \times 3$

For 240 volt 1 Ø systems

Amps = $kW \times 4$

System Capacity - Load Calculator

DIRECTIONS FOR NEC 2008, ARTICLE 220, PART IV	
220.80 Optional Feeder and Service Load Calculations (RESIDENTIAL)	NEC REFERENC
I SECTION DAN BE USED FOR DWELLING UNITS	
Served by a single feeder conductor (generator)	220.82
• 120/240 volt or 208Y/120 volt service	
Ampacity of 100 amps or greater	
The calcultated load will be the result of adding	
• 220.82 (B) General Loads, and	
220.82 (C) Heating and Air-Conditioning Load	220.82 (
 Calculated neutral load determined by 220.61. (Additional 70% demand factor can be taken for cooking appliances and dryers when tables 220.54 and/or 220.55 are used) 	220.82 (
GENERAL LOADS	
General Lighting and General-Use Receptacles	220.82 (8
Calculate at 3 VA per square foot	
 Use exterior dimensions of the home to calculate square footage – do not include open 	220.82 (B) (1
porches, garages, or unused or unfinished spaces not adaptable for future use.	
Add 20-amp small appliance & laundry circuits @ 1500 VA each Calculate the following to the control of th	
Calculate the following loads at 100% of nameplate rating	220.82 (B) (2
Appliances fastened in place, permanently connected or located on a specific circuit Banges, wall-mounted expansions are recommended in place.	220.82 (B) (3
Ranges, wall-mounted overs, counter mounted and its analysis and a specific circuit	220.82 (B) (3)
 Ranges, wall-mounted ovens, counter-mounted cooking units (Tables 220.54 & 220.55) Clothes dryers not connected to the laundry branch circuit 	220.82 (B) (3)
Water heaters	220.82 (B) (3)
	220.82 (B) (3)
Permanently connected motors not included in Heat & Air-Conditioning Load section EATING & AIR-CONDITIONING LOADS	220.82 (B) (4
nclude the largest of the following six selections (kVA load) in calculation	220.82 (C
Air Conditioning and Cooling	(0)
• 100% of nameplate rating	220.82 (C) (1)
Heat Pumps Without Supplemental Electric Heating	(0) (1)
• 100% of nameplate rating	220.82 (C) (2)
Heat Pumps With Supplemental Electric Heating	(-/ (-/
• 100% of nameplate rating of the heat pump compressor*	220.82 (C) (3)
65% of nameplate rating of supplemental electric heating equipment	(-) (-)
- If compressor & supplemental heat cannot run at the same time	
do not include the compressor	
Electric Space Heating	
Less than 4 separately controlled units @ 65% of nameplate rating 4 or more separately controlled units @ 40% of nameplate rating	220.82 (C) (4)
• 4 or more separately controlled units @ 40% of nameplate rating	220.82 (C) (5)
40% of nameplate rating if 4 or more separately controlled units Sectric Thermal Storage for system where the first section is a second section.	==0.02 (0) (0)
Electric Thermal Storage (or system where the load is expected to be ontinuous at nameplate rating	220.82 (C) (6)
• 100% of nameplate rating	220.02 (0) (0)
 Systems of this type cannot be calculated under any other section of 220.82 (C). 	
AD CALCULATIONS	
ieneral Lighting Load	
arial Appliance & Lauridry Circuits	
Ferrances & Motora (100 % rated 1090)	
2. 22.07.01010	^/
- First 10 kVA @ 100%	
- Remainder of General Loads @ 40% = 10,000 VA (Total VA - 10,000) x	40
Calculated O	
EAT / A-C LOAD @ 100% = Calculated General Load Largest Heat or A-C Load	
enting VA TO MW (Single In the Control of the Contr	

Worksheet — NEC	2008, 220 P	AND THE RESERVE OF THE PERSON	Secretary and all the second s		
Contractor	NAME OF THE OWNER OF THE	Ernaii	Name that you considerated Parameter St.	Own Series (Series Series Seri	
Phone	THE PROPERTY OF THE PARTY OF TH	Fax			
Job Name	entremonal lateral and the department of the second			-	
Date	Location		DELINE VALUE DE MESSE DE VINCO CE		
Voltage (Circle)	240V -1Ø	NG	LPV		
Fuel	100 Amp	200 Amp	400 Amp	Ott	127
Elec. Service	TOO AITIP	Zou Amp	400 Allih		101
NET SQUARE FOOTAGE	NOW ASSESSMENT OF THE PARTY OF		SAME OF THE SAME O	1 (1/4)	Loads (kW)
GENERAL LOADS	Qty	Rating (Load)	Factor	Loads (VA)	(VA ÷ 1,000)
General Lighting and General Use Receptacles		3 VA/ft²	100%		
Branch Circuits (1500 VA/ft²)			WITH THE PARTY OF		
Small Appliance Circuits (20 Amp)	negycz werowich strong greech take	1500	100%	<u> </u>	English Company
Laundry Circuits		1500	100%		ļ
Fixed Appliances		Full Current Rating			
Well			100%		
Sump Pump			100%		
Freezer			100%		
Microwave (Not counter-top model)	CONTROL SEED STORY OF SEEDING		100%		
Disposal	TO THE STATE OF TH	ALEXANDER OF THE PROPERTY OF T	100%		
Dishwasher			100%		
Range (See Table 220.55 for multiple cooking appliances)	HANDYCKERS CHRORESCHARDEN		100%		
			100%		
Wall-Mounted Oven	232-232-1-1		100%		
Counter-Mounted Cooking Surface	Personal Property and Parket State S		100%		
Water Heater	AND THE PROPERTY OF THE PROPER	-	100%	-	-
Clothes Dryer		1			
Garage Door Opener			100%		
Septic Grinder			100%		
Other (list)			100%		
			100%		
A CONTRACTOR OF THE CONTRACTOR			100%		
ASSECT BASING CONTRACT OF CONT			100%		
DOMESTIC DE ART SECURE LECTOR CHARLECTURE SERVICES ES CALLETTURE COM OCCUPANTO CONTROL COM OCCUPANTO CONTROL COM OCCUPANTO CONTROL COM OCCUPANTO CONTROL CONTR			100%		
TO SEE THE PROPERTY OF THE PRO			100%		
Characteristics protein and an extension of the state of			100%		
	and the same state of the same		100%		
NEED TENSON OF A SECURITY OF A			100%		
			100%		
Total General Loads			CP	VA	kW
NATIONAL DESCRIPTION OF THE PROPERTY OF THE PR	TA TOWN AND THE TANK AND THE TA		- CONTRACTOR CONTRACTO	- Lancon Common	
HEAT / A-C LOAD			100%		
A-C / Cooling Equipment	Pegaston Control Control Control Santage	The state of the s	. 00.10		
Heat Pump	A STATE OF THE STA	-	100%		
Compressor (if not included as A-C)	THE RESIDENCE OF THE PARTY OF T	-	65%	_	Marie Carlos Pilly (Colonia Marie Santa
Supplemental Electric Heat	CONTRACTOR OF THE PROPERTY OF		00.0		
Electric Space Heating	CONTRACTOR OF THE STATE OF THE		65%		CIMMONICA TARGET
• Less than 4 separately controlled units			-	-	
 4 or more separately controlled units 		-	40%		
System With Continuous Nameplate Load	CANADA CONTRACTOR OF THE SAME		100%		
Largest Heat / A-C Load (VA) VA kW				1	1
GENERAL LOADS			y energy		
• 1st 10 kW of General Loads 100% kW			100%	ΚW	
 Remaining General Loads (kW) 40% kW 			40%	kW	
CALCULATED GENERAL LOAD (kW) kW					<u>kW</u>
LARGEST HEAT / A-C LOAD 100% kW kW					KY
TOTAL CALCULATED LOAD (Nat General Loads + Heal/A-C Load)					kw